GUIDELINE	PERFORMANCE	EXCEPTIONS
1) Status Reports a) Notify Supervisor of changes in facility status, and all abnormalities and unexpected situations	1) Status Reports a) Operators and supervisors follow OPM 10.1, "Procedure for Reporting an Emergency, Unusual or Off Normal Occurrence." Events that do not meet the criteria of OPM 10.1, "Occurrence Reporting and Processing of Operations Information," are reported under the C-AD Trouble Report System, see OPM 2.9. The Operator's Log documents day-to-day changes in facility status and is reviewed each day by C-AD management. Abnormalities and unexpected situations at TVDG are reported according to the notification list in OPM 12.5, "Emergency Notification List," and at the rest of C-AD in OPM 10.1.a, "Occurrence Notification Call List."	1) Status Reports None
2) Safety Practices a) Adhere to BNL safety program, including the use of protective equipment	2) Safety Practices a) OPM 2.2, "Operating Practices" requires operations crews to adhere to procedures and to sound operating practices. All operators are trained in appropriate safety courses such as electrical safety, radiation safety, and hazardous materials handling. Areas and/or equipment are posted with requirements for protective equipment such as safety glasses, hearing protection, and hard hats. Work planning procedures, OPM 2.28, "C-A Procedure for Work Planning and Control for Operations" and OPM 2.29, "Procedure for Enhanced Work Planning for Experiments" are used to define safety requirements including protective equipment at the planning stage for specific jobs or experiments.	2) Safety Practices None
3) Inspection Tours a) Perform inspection tours to ensure the status of equipment is known b) Use tours to become familiar with the facility condition c) Tour activities should include: i) Reviewing equipment status	3) Inspection Tours a) The on-duty Operations Coordinator visits, each shift, experimenters and the experimental areas b) Tour activities at C-AD are covered in OPM 2.2 "Operating Practices." Shift personnel perform a tour of the accelerators and experimental areas and perform surveillance activities according to their procedures. OPM 12.7, "Facility Startup Inspection" describes specific facility tours at TVDG. Tours or sweeps are also used to ensure personnel are out of primary and secondary areas before beam is enabled. c) Tour activities include the following: i) A periodic review of equipment status including an examination of radiation levels, particle fluence rates, system pressures, temperatures and access control mode.	3) Inspection Tours None

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ii) Looking for unexpected conditions	ii) Operators are trained to look for unexpected conditions such as water leaks or smoke and to check local status panels and local alarms when on tour. The operators are also trained to inspect for area-specific abnormal conditions; for example, see OPM 4.7, "Secondary Beam Line Sweep, Access and Clearance Procedures."	
iii) Checking panel & annunciator operation	iii) Local annunciators alert the person on tour to abnormal conditions. For inaccessible areas, panel annunciators are used to alert the operator in the Main Control Room (MCR). Primary areas are inaccessible during operations periods. Inaccessible areas use various sensors for smoke, water, pressure, ground faults and radiation which annunciate in the Main Control Room and/or at the Target Desk when appropriate.	
iv) Notation of any deficiencies found	iv) Deficiencies are noted in Trouble Reports or the logs of the various touring groups or, if necessary, reported back up the supervisory chain for immediate action	
4) Round Tours a) Use approved Round Tour Inspection Sheets	4) Round Tours a) The RCTs, Cryogenic Watch, Experiment Shift Leaders (ESLs) and Collider Accelerator Support (CAS) perform tours and record their findings. Approved inspection sheets are used; for example, area-specific sweep checklists, RCT survey forms, and Hazardous Gas Checklists.	4) Round Tours None
b) Record key parameters to analyze performance of systems and equipment and to facilitate shift turnover	b) Key parameters for equipment and systems are monitored and recorded in the Main Control Room and at remote locations. Set points are monitored in the Main Control Room every 24 hours. Shift records are maintained and reviewed during an overlap period in the shift change.	
c) Round sheets should have the maximum and minimum values and operational safety limits highlighted to facilitate comparison with noted values.	c) The maximum and minimum values are in the controls database for parameters monitored from the Main Control Room. Operational safety limits are listed in procedures. Maximum radiation levels are denoted by standard radiological area classifications. Cryogenic and hydrogen target systems have parameter ranges written on their round sheets.	
d) Review recorded values for trends	d) Radiation surveys and area monitoring data are routinely reviewed to estimate potential exposure of workers and experimenters. Equipment operations are continually monitored from the Main Control Room and undesirable trends are determined in advance of equipment failures. For	

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	example, the radiation monitoring system detects beam losses well before serious radiation events occur. Operators respond to this alert by returning power supplies back to service or by realigning the beam through magnet current settings. Radiation alarms are automatically recorded. Radiation data is summarized in hourly averages along with beam-intensity data and these values are reviewed periodically by supervisors and management, and daily by the RCTS. The C-AD Radiation Safety Committee and the ALARA Committee review the long-term trend of radiation levels. In the event of machine interruption, summaries of operator actions are recorded in the Operations Journal, and the Journal is reviewed each day. Various categories of machine downtime are recorded and long-term trends are examined. The Head of the Cryogenics Group periodically reviews the cryogenic system performance and hydrogen target checklists for trends in pressure or temperature.	
5) Personnel Protection a) Conform to 10CFR835 (ALARA) b) Assure proper use of Work Permits c) Supervisors should review exposure trends of workers	5) Personnel Protection a) Operators are trained in ALARA practices during: a) BNL's Rad Worker I training, b) Collider-Accelerator Access training, which is C-AD-site-specific-training, and c) BNL's Contamination Worker training. Additionally, the C-AD ALARA Committee procedures are in conformance with 10CFR835 Implementation Guide for Occupational ALARA Program. b) Work Permits (OPM 1.11 and OPM 2.28) or Radiation Work Permits (OPM 9.5.4) are required for specific jobs at C-AD. Proper use of these permits is reviewed via C-AD self-assessments or via quality assurance audits. Generic work permits are used for routine tours, inspections or work observations. c) Supervisors review exposure trends periodically by reviewing self-reading dosimeter data and TLD results. The C-AD ESHQ Division management reviews and posts individual dose data each month on the web. Managers, ALARA Committee members, and supervisors review quarterly dose records via the C-AD Performance Indicator program. From time-to-time, special ad hoc committees made up of supervisors and managers are set up to review overall exposure trends at C-AD. Annually, the C-AD ALARA Committee reviews all radiological data from the prior year and makes recommendations to the C-AD Department Chair on dose goals for the coming year.	5) Personnel Protection None

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6) Response to Indications a) Identify and correct faulty instruments b) Believe instrument readings unless proven unreliable	6) Response to Indications a) Prompt action is taken to investigate abnormal or unexpected indication, see, for example, OPM 6.1.2, "Responding to Interlocking Chipmunk Alarms," or OPM 6.1.3, "Responding to Chipmunk Alarms". b) Operators are instructed to believe instrument readings and treat them as accurate unless proven otherwise, see OPM 2.2, "Operating Practices," section 2.7. In order to instill trustworthiness, the area-radiation system is calibrated annually according to ANSI standards. See OPM 8.15.1, "C-A Equipment Annual Calibration Procedure for Chipmunks" and 8.15.2, "C-A Equipment Calibration Procedure for Chipmunk Test Box." The function of the Access Control System is also tested every year to improve reliability. See OPM Chapter 4.	6) Response to Indications None
7) Resetting Protective Devices a) Understand current conditions prior to resetting protective devices	7) Resetting Protective Devices a) When a protective device trips the accelerator down to a safe state, such as would happen if unexpected radiation was seen by an area-radiation monitor, an undertaking is made by Operators to understand the trip before the device is reset. The formality of this undertaking is written into procedures. See, for example, OPM 6.1.2, OPM 6.1.3 for radiation alarm response and OPM 4.44 and OPM 12.11 for oxygen deficiency alarm response.	7) Resetting Protective Devices None
8) Load Changes a) Supervisor must approve any changes	8) Load Changes a) The Operations Coordinator approves all power or process rate changes. See OPM 2.2, "Operating Practices," section 2.9. Additionally, drawings must be prepared, reviewed and acknowledged, to assure that all safety procedures have not been compromised before ac power systems are changed, see OPM 8.17.1, "Procedure for Documenting and Acknowledging Changes to AC Power Systems for Collider-Accelerator." Finally, the MCR Group Leader provides guidance to the MCR on which major loads shall be turned off when they are no longer needed for safety, equipment protection or programmatic reasons. See OPM 2.30, "Monitoring, Controlling and Minimizing Unnecessary Power Consumption by C-A Accelerators."	8) Load Changes None
9) Authority to Operate a) Operators should understand their authority to operate and that of the Supervisor	9) Authority to Operate a) Trained and qualified personnel operate C-AD equipment. A web-based database lists all training records and identifies qualified personnel according to job classification (e.g., MCR Operators, Operations	9) Authority to Operate None

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	Coordinators, Power Room Operators, CAS, Cryogenic Target Watch, RCTs and TVDG operators). R2A2s are signed by personnel so that they are able to personally acknowledge their roles, responsibilities, authorities and accountabilities.	
10) Shift Operating Bases a) Establish places for administration, communications, and shift turnover	10) Shift Operating Bases a) The C-AD Main Control Room serves as the operating base. It is equipped with office equipment needed to conduct duties, including communications equipment. It has a separate conference room and other areas for conducting shift changeover activities. Other operating bases include the RCT Trailer, the g-2 Cryogenic Control Room, the RHIC Cryo Control Room, the CAS Target Desk and the TVDG Control Room. These areas are also equipped with communications.	10) Shift Operating Bases None
11) Potentially Distractive Material a) Should be prohibited or controlled	11) Potentially Distractive Material a) Written material not pertinent to operations and entertainment devices are generally prohibited from use by on-duty personnel unless specifically approved by the Head of Operations. See OPM 2.3, "Activities in Control Rooms."	11) Potentially Distractive Material None